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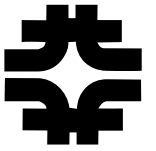
# Facilities Engineering Services Section

David Nevin

Fermilab

March 16, 2004

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**Better known as**

**FESS**

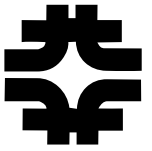
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# F stands for facilities

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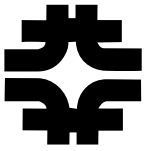
- Provide robustness (capacity and reliability) to the many utilities across the site
- Maintain the fire protection and detection systems across the site
- Provide preventive and corrective maintenance to buildings and utilities across the site
- 24 hours a day, 7 days a week



# E stands for engineering

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- Provide various engineering disciplines to plan and design conventional construction of buildings and infrastructure from a life cycle sustainable design perspective
- Coordinate engineering activities contracted out to A&E firms
- Task manage or construction coordinate civil construction projects for our customers

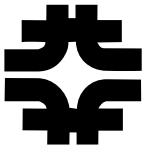


# S stands for services

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- Maintain real property assets including grounds
- Provide building condition assessments
- Provide janitorial services across the site
- Maintain the tall grass prairie and buffalo herd
- Provide T&M contractors for small projects
- Act as lead with municipality interfaces

# The second S stands for section



- We are one of four sections within the Lab

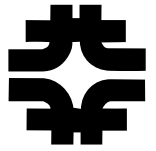


## MISSION STATEMENT

To establish and maintain a dependable base  
from which particle physics and other  
Fermilab programs can be safely  
accomplished without interruption

# Plant

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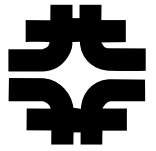


- Fermi site contains 6800 acres
- 343 buildings (2,287,245 square feet)
- 109 trailers (91,186 square feet)
- Electric system – power received at 345kV from utility grid at 2 primary substations, 280 secondary substations, 115 miles of cable (100 miles underground)
- Natural gas system – 14 miles of underground piping
- Pond water system – 16 ponds with return and supply channels
- Industrial cooling water – 21 miles of piping
- Sanitary system – 11 miles of sewer collection piping
- Domestic water system – 4 wells, treatment and distribution piping



# FESS Charter (responsibilities)

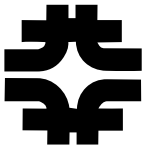
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- Provide capacity for Fermilab's scientific mission
- Maximize infrastructure reliability
- Lead the laboratory infrastructure recapitalization program
- Inspect condition of DOE assets
- Provide a work environment that is environmentally sound and aesthetically pleasing

# Functional Overview

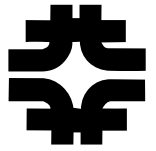
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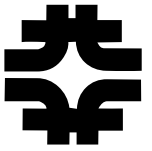
Engineering Group  
Operations Group  
Services Group  
Infrastructure Mgmt Group

# FESS Engineering Group

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- Provide facilities in support of the research mission that are functional, economical, efficient, reliable and inspiring
  - Conceptual to final design
    - New facilities and infrastructure
    - Modifications to existing facilities and infrastructure
  - Construction Management
  - Project Management
  - Project Documentation (as built)



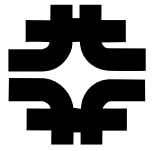
# How Do We Accomplish This?

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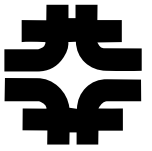
- By maintaining an in-house team of professionals with a combined breadth of expertise to fulfill our mission
- By providing timely, state-of-the-art solutions to engineering challenges
- By augmenting our staff using consultants on an as needed basis
- By implementing construction safety and construction quality management

# FESS Operations Group

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- Provides predictable capacity and up-time using preventive, predictive and corrective maintenance technologies
- Develops and implements an annual maintenance plan matching growing requirements with available resources
- Manages year round 24 hour maintenance and operational coverage of the site infrastructure



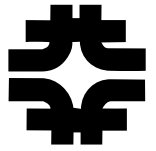
# How do we accomplish this?

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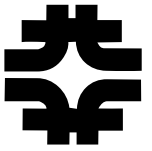
- By developing, supporting and managing an effective multi-shift team of professional crafts people
- By implementing proven technologies such as:
  - Predictive Maintenance
  - Preventive Maintenance
  - Reliability Centered Maintenance
- By optimizing resources
  - People, tools and equipment

# FESS Services Group

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- Provide on going up-keep of the roads, grounds and parking areas
- Maintain and enhance natural laboratory property
- Support FESS computing needs
- Buffalo herd management
- Provide office design services
- Wilson Hall building management



# How do we accomplish this?

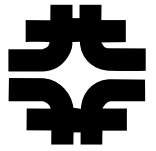
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- By providing efficient, cost effective and environmentally responsible solutions to roads and grounds issues
- By developing and managing a performance based custodial contract incorporating recycling
- By providing computing expertise to support various functions

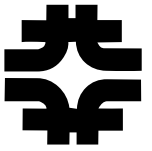


# FESS Infrastructure Management

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Develop and execute strategies which increase the reliability and robustness of Fermilab's infrastructure systems to strengthen the base from which existing and future laboratory objectives can be accomplished.



# How do we accomplish this?

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- Real Property Asset Management
  - FIMS, CAS, TYSP, IFI budget and reporting
- Third party investment vehicles
- By coordinating contracted T&M services and making them available to Div. and Sec.
- Energy and utility management

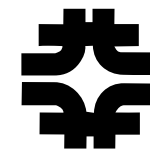
# FESS FY04 Budget

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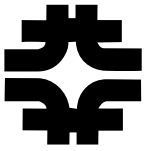


	SWF	M&S	Total
Actual	10,965.7	5,490.3	16,456.0
Inventory (Spares)		150.0	150.0
Chargebacks	-1,966.0		-1,966.0
Cap. Equipment	<u>          </u>	<u>175.0</u>	<u>175.0</u>
Total Budgeted	8,999.7	5,815.3	14,815.0

# Manpower Distribution



	<i>FACILITIES ENG. SERVICES SECTION</i> Staff levels (FTE's)											
	Monthly						Weekly / Hourly					
<b>FY04</b>	Admin & Management	Computer Professionals	Engineering Physicists	Engineers	Scientists	Other Technical Support	Clerical & Secretarial	Drafters	Service Workers	Skilled Trades	Technicians	TOTAL
<b>TOTAL (all Indirect)</b>	<b>19.0</b>	<b>3.0</b>	<b>0.0</b>	<b>28.0</b>	<b>0.0</b>	<b>13.4</b>	<b>13.0</b>	<b>2.0</b>	<b>3.0</b>	<b>52.1</b>	<b>5.0</b>	<b>138.5</b>



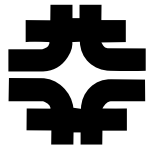
# Key Issues

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- Infrastructure funding
- Proposed performance measures
- Resources gap
  - We can be successful if **funding is adequate** and we can **retain** our key people
- Keep staff trained to match activities
  - We have a solid Continuous Improvement Program

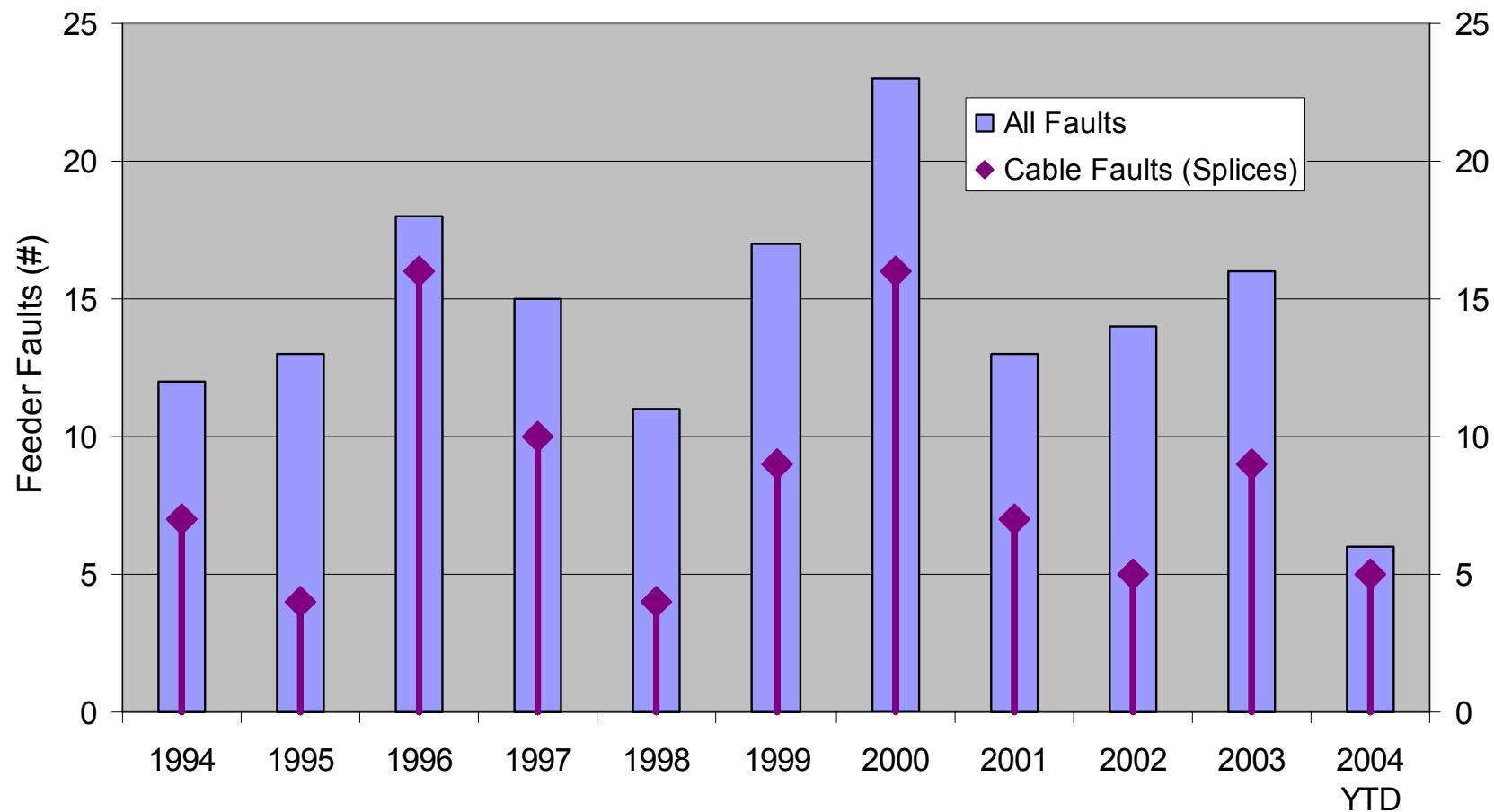
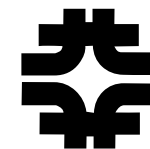
# Infrastructure Risks (mitigated)

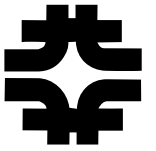
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- Third Party Financing
  - Central Utility Building electrical and mechanical rebuild
  - Majority of “critical” electrical feeders
  - CDF to D0 utility corridor (ICW, DWS, gas and sanitary)
- NuMI water reuse (pond water supply)
- Transformer repair and duct bank replacement
- One “critical” 345 kV pole replacement

# Feeder Fault History





# Infrastructure Risks (foreseen)

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- 345 kV wood power poles
- 13.8kV electrical high voltage system
- ICW underground piping and reservoir supply
- DWS supply and distribution piping
- South Batavia Dam impact on make-up water





# Tracking Progress and Metrics

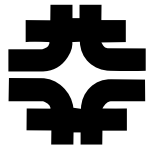
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## Self Assessments:

- Daily meeting with FESS leadership
- Weekly meetings with Divs. and Secs.
- Weekly meeting with Directorate
- Monthly FESS group briefings (metrics)
- Performance goals and evaluations
- Multiple operational metrics

# Integrated Safety Management

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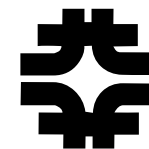
- New employee orientation program
- Work activity assessments and walkthrough
- Job planning and hazard analysis
- No Maintenance Zones
- Investigation incidents and near misses
- Periodic safety meetings involving all staff
- Committee membership and participation



# Communication

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- Monthly Operations meeting with Accel. Div.
- Monthly LAM
- Monthly Group Managers meetings
- Weekly AD scheduling meetings
- NuMI PMG
- Customer feedback
- Daily face to face and e-mail



“World Class”  
Facilities and Infrastructure  
for  
“World Class”  
Physics